

Applicants thank the Examiner for considering the previously filed Information Disclosure Statement, PTO-1449 paper and cited references.

**II. Rejection of Claims 7 to 17 Under 35 U.S.C. § 112**

Claims 7 to 17 were rejected under 35 U.S.C. § 112, second paragraph as indefinite for allegedly failing to particularly point out and distinctly claim the subject matter of the invention. The Office Action contends that "[t]hese claims are vague and indefinite in that they purpose [sic] to be drawn to a method for charging but no process or method steps are claimed." Office Action at p. 2. Applicants respectfully disagree. In this regard, the Examiner's attention is directed to, for example, claim 8, line 2, which recites that "a definition is made," which is a method step. The Examiner's attention is further directed to, for example, claim 12, line 2, which recites that a "control unit (D) determines that correction factor," which is also a method step. Moreover, claim 13 recites that "the control unit determines the correction factor," claim 14 recites that "the normal travel distance and the respective actual travel distance are measured," claim 15 recites that "the correction factor is measured" and claim 16 recites that "the correction factor is stored." All of the foregoing limitations are method steps. It is therefore respectfully submitted that claims 7 to 17 fully comply with the requirements of 35 U.S.C. § 112, and withdrawal of this rejection is therefore respectfully requested.

With regard to claim 12, the Examiner will note that claim 12 has been amended herein without prejudice to change "the control unit" to --a control unit--. It is therefore respectfully submitted that claim 12 fully complies with the requirements of 35 U.S.C. § 112, and withdrawal of this rejection is therefore respectfully requested.

**III. Rejection of Claims 1, 3, 4 and 8 Under 35 U.S.C. § 102(a)**

Claims 1, 3, 4 and 8 were rejected under 35 U.S.C. § 102(a) as anticipated by Japanese Published Patent Application No. 7-107753 ("Hirotsada et al.") or Japanese Published Patent Application No. 63-167684 ("Katsuhiro et al."). Applicants respectfully submit that neither Hirotsada et al. nor Katsuhiro et al. anticipates the present claims for the following reasons.

Claim 1 relates to an apparatus for charging a piezoelectric element. Claim 1 recites that an activation voltage and an activation charge value for driving

the piezoelectric element is controlled online by a control unit which adjusts the activation voltage and activation charge values in order to compensate for deviations caused by variations in the piezoelectric element layer thickness or the number of layers.

Claim 8 relates to a method for charging a piezoelectric element. Claim 8 recites that a definition is made, prior to charging, as to a value for an activation voltage and a value for an activation charge of the piezoelectric element as a function of batch variation in the travel of the piezoelectric element.

Hirotsada et al. purport to relate to a piezoelectric-element driving device, and Katsuhiko et al. purport to relate to a control circuit for a piezoelectric actuator. In support of the present rejection, the Office Action merely states that "[c]laims 1, 3, 4 and 9 are rejected under 35 U.S.C. § 102(a) as being clearly anticipated by Japan (753) [Hirotsada et al.] or Japan (684) [Katsuhiko et al.]." As an initial matter, it is "well settled that the burden of establishing a prima facie case of anticipation resides with the Patent and Trademark Office." Ex parte Skinner, 2 U.S.P.Q.2d 1788 (Bd. Pat. App. & Inter. 1986). Furthermore, "it is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference." Ex parte Levy, supra, 17 U.S.P.Q.2d at 1461, 1462 (Bd. Pat. App. & Inter. 1990). It is respectfully submitted that the conclusory statement that "[c]laims 1, 3, 4 and 9 are . . . clearly anticipated by Japan (753) [Hirotsada et al.] or Japan (684) [Katsuhiko et al.]" fails to establish a prima facie case of anticipation of claims 1, 3, 4 and 9. It is therefore respectfully submitted that this rejection should be withdrawn for this reason alone.

Moreover, it is respectfully submitted that neither Hirotsada et al. nor Katsuhiko et al. discloses, or even suggests, an apparatus for charging a piezoelectric element in which an activation voltage and an activation charge value for driving the piezoelectric element is controlled online by a control unit which adjusts the activation voltage and activation charge values in order to compensate for deviations caused by variations in the piezoelectric element's layer thickness or the number of layers as recited in claim 1. In addition, it is respectfully submitted that neither Hirotsada et al. nor Katsuhiko et al. discloses, or even suggests, a method for charging a piezoelectric element in which a definition is made, prior to charging, as to a value for an activation voltage and a value for an activation charge

of the piezoelectric element as a function of batch variation in the travel of the piezoelectric element as recited in claim 8.

To anticipate a claim, each and every element as set forth in the claim must be found in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). That is, the prior art must describe the elements arranged as required by the claims. In re Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). As more fully set forth above, it is respectfully submitted that neither Hirotsuda et al. nor Katsuhiko et al. discloses, or even suggests, all of the limitations of claims 1 and 8. It is therefore respectfully submitted that neither Hirotsuda et al. nor Katsuhiko et al. anticipates claims 1 and 8.

Additionally, to reject a claim under 35 U.S.C. § 102, the Examiner must demonstrate that each and every claim limitation is contained in a single prior art reference. See, Scripps Clinic & Research Foundation v. Genentech, Inc., 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Still further, not only must each of the claim limitations be identically disclosed, an anticipatory reference must also enable a person having ordinary skill in the art to practice the claimed invention, namely the inventions of the rejected claims, as discussed above. See, Akzo, N.V. v. U.S.I.T.C., 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986). In particular, it is respectfully submitted that, at least for the reasons discussed above, the references relied upon would not enable a person having ordinary skill in the art to practice the inventions of the rejected claims, as discussed above. Also, to the extent that the Examiner is relying on the doctrine of inherency, the Examiner must provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics necessarily flows from the teachings of the applied art." See M.P.E.P. § 2112; emphasis in original; and see, Ex parte Levy, supra, 17 U.S.P.Q.2d 1461 at 1464. Thus, the M.P.E.P. and the case law make clear that simply because a certain result or characteristic may occur in the prior art does not establish the inherency of that result or characteristic. Accordingly, the anticipation rejection as to the rejected claims must necessarily fail for the foregoing reasons.

In summary, it is respectfully submitted that neither Hirotsuda et al. nor Katsuhiko et al. anticipates claims 1 and 8.

As for claims 3 and 4, which ultimately depend from claim 1 and therefore include all of the limitations of claim 1, it is respectfully submitted that neither Hirotada et al. nor Katsuhiro et al. anticipates these dependent claims for at least the same reasons given above in support of the patentability of claim 1.

**IV. Rejection of Claims 1, 2, 8 and 9 Under 35 U.S.C. § 102(a)**

Claims 1, 2, 8 and 9 were rejected under 35 U.S.C. § 102(a) as anticipated by U.S. Patent No. 4,593,658 ("Moloney") or U.S. Patent No. 5,053,668 ("Mitsuyasu"). Applicants respectfully submit that neither Moloney nor Mitsuyasu anticipates the present claims for the following reasons.

Moloney purports to relate to a valve operating mechanism for internal combustion and like-valved engines, and Mitsuyasu purports to relate to an apparatus for driving a piezoelectric element for closing and opening a valve member. In support of the present rejection, the Office Action merely states that "[c]laims 1, 2, 8 and 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Moloney or M[i]tsuyasu." Office Action at p. 2. However, as more fully set forth above, it is respectfully submitted that such conclusory statements fail to establish a prima facie case of anticipation, for which the Office carries the burden of proof. It is therefore respectfully submitted that this rejection should be withdrawn for this reason alone.

Moreover, it is respectfully submitted that neither Moloney nor Mitsuyasu discloses, or even suggests, an apparatus for charging a piezoelectric element in which an activation voltage and an activation charge value for driving the piezoelectric element is controlled online by a control unit which adjusts the activation voltage and activation charge values in order to compensate for deviations caused by variations in the piezoelectric element's layer thickness or the number of layers as recited in claim 1. In addition, it is respectfully submitted that neither Moloney nor Mitsuyasu discloses, or even suggests, a method for charging a piezoelectric element in which a definition is made, prior to charging, as to a value for an activation voltage and a value for an activation charge of the piezoelectric element as a function of batch variation in the travel of the piezoelectric element as recited in claim 8.

In view of all of the foregoing, it is respectfully submitted that neither Moloney nor Mitsuyasu anticipates claims 1 and 8.

As for claim 2, which depends from claim 1 and therefore includes all of the limitations of claim 1, and claim 9, which depends from claim 8 and therefore includes all of the limitations of claim 8, it is respectfully submitted that neither Moloney nor Mitsuyasu anticipates these dependent claims for at least the same reasons given above in support of the patentability of claims 1 and 8.

**V. Rejection of Claims 3 to 7 and 10 to 14 Under 35 U.S.C. § 103(a)**

Claims 3 to 7 and 10 to 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over Moloney or Mitsuyasu in view of U.S. Patent No. 5,384,507 ("Takada et al.") or U.S. Patent No. 6,340,858 ("Jaenker"). Applicants respectfully submit that the combination of Moloney or Mitsuyasu and Takada et al. or Jaenker does not anticipate the present claims for the following reasons.

Claims 3 to 7 ultimately depend from claim 1 and therefore include all of the limitations of claim 1, and claims 10 to 14 ultimately depend from claim 8 and therefore include all of the limitations of claim 8. As more fully set forth above with respect to claims 1 and 8, neither Moloney nor Mitsuyasu discloses, or even suggests, all of the limitations of claims 1 and 8. Takada et al. and Jaenker are not relied on for disclosing or suggesting the limitations of claims 1 and 8 not disclosed or suggested by Moloney or Mitsuyasu. Indeed, it is respectfully submitted that neither Takada et al. nor Jaenker discloses, or even suggests, the limitations of claims 1 and 8 not disclosed or suggested by Moloney or Mitsuyasu.

The Office Action contends that "Moloney and Mitsuyasu teach compensating a stack of piezoelectric elements in a fuel injector for travel distance based on variation, between actual and ideal conditions," Office Action at p. 3, but provides no support for such assertion. The Office Action further contends that "Takada [et al.] and Jaenker teach measuring the relationship between voltage and displacement and thus obtaining a correction factor," Office Action at p. 3, but provides no support this assertion. The Office Action concludes that "[i]t would have been obvious to one of ordinary skill in the art [sic] to select from among known compensation techniques and thus to use voltage factors in the devices of Moloney or Mitsuyasu." Office Action at p. 3. Applicants respectfully disagree.

As an initial matter, obviousness must be determined with reference to that which would have been obvious to one of ordinary skill in the art at the time the invention was made. Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693,

218 U.S.P.Q. 865 (Fed. Cir. 1983), cert. denied, 464 U.S. 1043 (1984). The present Office Action does not even allege that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify or combine the cited references. Indeed, the Office Action merely alleges that "[i]t would have been obvious to one of ordinary skill in the art [sic] to select from among known compensation techniques and thus to use voltage factors in the devices of Moloney or Mitsuyasu." Office Action at p. 3. It is therefore respectfully submitted that this rejection should be withdrawn for this reason alone.

In rejecting a claim under 35 U.S.C. § 103(a), the Examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish prima facie obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. In re Merck & Co., Inc., 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). As indicated above, it is respectfully submitted that neither Moloney nor Mitsuyasu discloses, or even suggests, all of the limitations of claim 1, from which claims 3 to 7 ultimately depend, or claim 8, from which claims 10 to 14 ultimately depend, and it is respectfully submitted that neither Takada et al. nor Jaenker discloses, or even suggests, the limitations of claims 1 and 8 not disclosed or suggested by Moloney or Mitsuyasu. It is therefore respectfully submitted that the combination of Moloney or Mitsuyasu and Takada et al. or Jaenker does not render obvious dependent claims 3 to 7 and 10 to 14.

Moreover, it is respectfully submitted that the cases of In re Fine, supra, and In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), make plain that the Office Action's generalized assertions that it would have been obvious to modify or combine the references do not properly support a § 103 rejection. It is respectfully submitted that those cases make plain that the Office Action reflects a subjective "obvious to try" standard, and therefore does not reflect the proper evidence to

support an obviousness rejection based on the references relied upon. In particular, the Court in the case of In re Fine stated that:

The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. This it has not done. . . .

. . . .

**Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.**

In re Fine, 5 U.S.P.Q.2d at 1598 to 1600 (citations omitted; italics in original; emphasis added). Likewise, the Court in the case of In re Jones stated that:

Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. . . .

**Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].**

In re Jones, 21 U.S.P.Q.2d at 1943, 1944 (citations omitted; italics in original).

That is exactly the case here since it is believed and respectfully submitted that the present Office Action offers no evidence whatsoever, but only conclusory hindsight, reconstruction and speculation, which these cases have indicated does not constitute evidence that will support a proper obviousness finding. Unsupported assertions are not evidence as to why a person having ordinary skill in the art would be motivated to modify or combine references to provide the claimed subject matter of the claims to address the problems met thereby. Accordingly, the Office must provide proper evidence of a motivation for modifying or combining the references to provide the claimed subject matter.

More recently, the Federal Circuit in the case of In re Kotzab has made plain that even if a claim concerns a "technologically simple concept" -- which is not the case here -- there still must be some finding as to the "specific understanding or principle within the knowledge of a skilled artisan" that would motivate a person having no knowledge of the claimed subject matter to "make the combination in the manner claimed," stating that:

In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab's invention to make the combination in the manner claimed. In light of our holding of the absence of a motivation to combine the teachings in Evans, we conclude that the Board did not make out a proper prima facie case of obviousness in rejecting [the] claims . . . under 35 U.S.C. Section 103(a) over Evans.

In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000) (emphasis added). Again, it is believed that there have been no such findings.

Accordingly, there is no evidence that the references relied upon, whether taken alone, combined or modified, would provide the features and benefits of claims 3 to 7 and 10 to 14. It is therefore respectfully submitted that claims 3 to 7 and 10 to 14 are allowable for these reasons.

#### **VI. Rejection of Claims 15 to 17 Under 35 U.S.C. § 103(a)**

Claims 15 to 17 were rejected under 35 U.S.C. § 103(a) as unpatentable over Moloney or Mitsuyasu in view of Takada et al. or Jaenker and further in view of U.S. Patent No. 5,575,264 ("Barron") or U.S. Patent No. 6,247,451 ("Estevenon et al."). Applicants respectfully submit that the combination of Moloney or Mitsuyasu and Takada et al. or Jaenker and Barron or Estevenon et al. does not render obvious the present claims for the following reasons.

Claims 15 and 16 depend from claim 10, which depends from claim 8, and claim 17 depends from claim 16. Therefore, claims 15 to 17 include all of the limitations of claims 8 and 10. As more fully set forth above with respect to claim 8,



neither Moloney nor Mitsuyasu discloses, or even suggests, all of the limitations of claim 8. As more fully set forth above with respect to claim 10, the combination of Moloney or Mitsuyasu and Takada et al. or Jaenker does not disclose, or even suggest, all of the limitations of claim 10. Neither Barron nor Estevenon et al. is relied on for disclosing or suggesting the limitations of claims 8 and 10 not disclosed or suggested by Moloney, Mitsuyasu, Takada et al. or Jaenker. Indeed, it is respectfully submitted that neither Barron nor Estevenon et al. discloses, or even suggests, the limitations of claims 8 and 10 not disclosed or suggested by Moloney, Mitsuyasu, Takada et al. or Jaenker.

Moreover, it is respectfully submitted that U.S. Patent No. 6,247,451 does not constitute prior art against the present application. The present application was filed on April 2, 2001 and claims priority to European Patent Application No. 00106990.5, filed on April 1, 2000. U.S. Patent No. 6,247,451 issued on June 19, 2001 from a U.S. national stage application filed under 35 U.S.C. § 371. Accordingly, U.S. Patent No. 6,247,451 does not constitute prior art against the present application. See M.P.E.P. §§ 706.02(a) and 2136.03.

In view all of the foregoing, it is respectfully submitted that the combination of Moloney or Mitsuyasu and Takada et al. or Jaenker and Barron or Estevenon et al. does not render obvious claims 15 to 17. Withdrawal of this rejection is therefore respectfully requested.

#### **VII. New Claims 18 to 34**

New claims 18 to 34 have been added herein. It is respectfully submitted that new claims 18 to 34 do not add any new matter and are fully supported by the present application, including the Specification. It is respectfully submitted that these claims are allowable.

#### **VIII. Conclusion**

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The attached page is captioned "**Version with Markings to Show Changes Made.**"

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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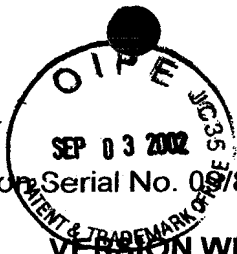
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Application Serial No. 09/824,193

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

Claim 12 has been amended, without prejudice, as follows:

12. (Amended) The method as defined in claim 11, characterized in that [the] a control unit (D) determines that correction factor by dividing the piezoelectric element's (10, 20, 30, 40, 50 or 60) normal travel distance to the piezoelectric element's (10, 20, 30, 40, 50 or 60) respective actual travel distance.

New claims 18 to 34 have been added.

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